

TOSHIBA

6F9E0086

INSTRUCTION MANUAL

TEMPERATURE CONTROL RELAY

MODEL RTM20

Read and understand this instruction manual before attempting any
installation, wiring or operation of this relay.

TOSHIBA CORPORATION

CODE: RY

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1. OUTLINE

The motor temperature monitoring unit can be used in various industrial fields as a protection relay for motor windings, bearings and internal atmosphere by monitoring and measuring their temperature through temperature measuring resistors.

The unit uses a microcomputer and can automatically stop temperature drift as it varies from preset reference points.

It can maintain accuracy over a wide temperature range.

Moreover, it is designed for flexibility and is reliable in a variety of environments.

Read this manual carefully and you will be able to use the relay correctly and effectively.

2. SPECIFICATIONS

Items	Specifications.	Remarks
1. Display temperature	-20 to +200°C	
2. Sensor inputs	8 RTDs	3-wire
3. Sensor type (RTD)	Selection -Resistance Platinum (Pt) 100Ω Nickel (Ni) 100Ω Nickel (Ni) 120Ω Copper (Cu) 10Ω	Resistance Tables are from ANSI.
4. Temperature accuracy	Pt 100Ω } Ni 100Ω } $\pm 0.5^\circ \text{ C}$ Ni 120Ω } cu 10Ω $\pm 1^\circ \text{ C}$	
5. Trip/Alarm set point	From 40° C to 195° C in graduations of 5° C.	

Items	Specifications								Remarks																									
<ul style="list-style-type: none"> Trip/alarm set point mode selector 	<p>Sensor inputs are divided into two or three sections, as follows.</p> <table border="1" data-bbox="520 265 1287 598"> <thead> <tr> <th data-bbox="520 265 742 349">Channel No.</th><th data-bbox="742 265 795 349">12</th><th data-bbox="795 265 847 349">3</th><th data-bbox="847 265 899 349">4</th><th data-bbox="899 265 952 349">5</th><th data-bbox="952 265 1004 349">6</th><th data-bbox="1004 265 1056 349">7</th><th data-bbox="1056 265 1287 349">8</th></tr> <tr> <th data-bbox="520 349 742 432">Mode</th><td data-bbox="742 349 795 432"></td><td data-bbox="795 349 847 432"></td><td data-bbox="847 349 899 432"></td><td data-bbox="899 349 952 432"></td><td data-bbox="952 349 1004 432"></td><td data-bbox="1004 349 1056 432"></td><td data-bbox="1056 349 1287 432"></td></tr> </thead> <tbody> <tr> <td data-bbox="520 432 742 515">1</td><td data-bbox="742 432 795 515"></td><td data-bbox="795 432 847 515"></td><td data-bbox="847 432 899 515"></td><td data-bbox="899 432 952 515"></td><td data-bbox="952 432 1004 515"></td><td data-bbox="1004 432 1056 515"></td><td data-bbox="1056 432 1287 515">B</td></tr> <tr> <td data-bbox="520 515 742 598">2</td><td data-bbox="742 515 795 598">A</td><td data-bbox="795 515 847 598">B</td><td data-bbox="847 515 899 598"></td><td data-bbox="899 515 952 598"></td><td data-bbox="952 515 1004 598"></td><td data-bbox="1004 515 1056 598"></td><td data-bbox="1056 515 1287 598">C</td></tr> </tbody> </table>	Channel No.	12	3	4	5	6	7	8	Mode								1							B	2	A	B					C	
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<p>7. outputs</p> <p>a. Alarm output</p> <table border="1" data-bbox="520 978 1307 1851"> <thead> <tr> <th data-bbox="520 978 742 1061"></th><th data-bbox="742 978 1307 1061">output</th><th data-bbox="1307 978 1537 1061"></th></tr> <tr> <th data-bbox="520 1061 742 1201">Conditions</th><th data-bbox="742 1061 1307 1201"></th><th data-bbox="1307 1061 1537 1201">Relay out-put</th></tr> </thead> <tbody> <tr> <td data-bbox="520 1201 742 1519">1</td><td data-bbox="742 1201 1307 1519"> <ul style="list-style-type: none"> 1. Temperature on A channels rises above $0.9 \times$ trip set value 2. (A) An A channel RTD contact breaks </td><td data-bbox="1307 1201 1537 1519"> <ul style="list-style-type: none"> Alarm (A) (1 circuit is closed) </td></tr> <tr> <td data-bbox="520 1519 742 1851">2</td><td data-bbox="742 1519 1307 1851"> <ul style="list-style-type: none"> 1. Temperature on B channels rises above $0.9 \times$ trip set value 2. (B) A B channel RTD contact breaks </td><td data-bbox="1307 1519 1537 1851"> <ul style="list-style-type: none"> Alarm (B) (1a) </td></tr> </tbody> </table>											output		Conditions		Relay out-put	1	<ul style="list-style-type: none"> 1. Temperature on A channels rises above $0.9 \times$ trip set value 2. (A) An A channel RTD contact breaks 	<ul style="list-style-type: none"> Alarm (A) (1 circuit is closed) 	2	<ul style="list-style-type: none"> 1. Temperature on B channels rises above $0.9 \times$ trip set value 2. (B) A B channel RTD contact breaks 	<ul style="list-style-type: none"> Alarm (B) (1a) 													
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Items	specifications			Remarks
7.	output			Indi-cator
	Conditions	Relay out-put		
	1. Temperature on C channels rises above $.9 \times$ trip set value	Alarm (C) (la)	-	
	2. (C) A C channel RTD contact breaks			
b. Trip output				
.	output			
	Conditions	Relay out-put	Trip indi-cator	
1	(A) Area A temperature rises above A channels' trip set value	Trip (A) (la)	Red on	
2	(b) Area B temperature rises above B channels' trip set value	Trip (B) (la)	Red on	
3	(C) Area C temperature rises above C channels' trip set value	Trip (C) (la)	Red on	

Items	Specifications	Remarks															
	<p>c. Contact capacity ($\cos\phi = 0.4$, $L/R = 7$ ms)</p> <table border="1" data-bbox="531 271 1219 437"> <tr> <td data-bbox="555 282 879 323">Resistive load</td> <td data-bbox="887 282 1211 323">Inductive load</td> </tr> <tr> <td data-bbox="586 334 847 375">250 Vac 5 A</td> <td data-bbox="919 334 1156 375">250 Vac 2 A</td> </tr> <tr> <td data-bbox="610 385 824 427">30 Vdc 5 A</td> <td data-bbox="942 385 1148 427">30 Vdc 2 A</td> </tr> </table> <p>* Inductive Load</p> <table border="1" data-bbox="531 531 1219 717"> <tr> <td></td> <td data-bbox="666 551 863 593">Continuous</td> <td data-bbox="903 551 1132 593">Interruptive</td> </tr> <tr> <td data-bbox="571 603 626 645">ac</td> <td data-bbox="729 603 808 645">5 A</td> <td data-bbox="927 603 1101 645">500 VA*1</td> </tr> <tr> <td data-bbox="571 655 626 697">dc</td> <td data-bbox="729 655 808 697">5 A</td> <td data-bbox="934 655 1085 697">50 W*2</td> </tr> </table>	Resistive load	Inductive load	250 Vac 5 A	250 Vac 2 A	30 Vdc 5 A	30 Vdc 2 A		Continuous	Interruptive	ac	5 A	500 VA*1	dc	5 A	50 W*2	
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ac	5 A	500 VA*1															
dc	5 A	50 W*2															
8. Display	<p>Channel 1 digit</p> <p>Measured value 3 digits</p>																
9. Sampling and response time	<p>1 Sampling time 4 S'/8 CH</p> <p>2 Output response time . . a S (max.)</p>																
10. Reset	<p>Selectable from auto or manual</p> <p>1 Auto (A) Automatic reset</p> <p>2 Manu. (M) Resets during MANUAL-RESET switch is being depressed.</p>	Hysteresis 5° c															
11. Power supply	<p>100 to 120 Vac (+10%, -15%) 50/60Hz or</p> <p>100 to 125 Vdc (+10%, -15%)</p>																
12. Insulation resistance	100 MO or more	With a 500 V megger															

* Note: *1 Maximum application voltage is 380 Vac and power factor ($\cos\phi$) is 0.4.

*2. Contact capacity at 30 Vdc and time constant (L/R) is 7 ms. Capacity must be derated at higher voltage.

Items	Specifications	Remarks
L3. Dielectric strength	2000 v ac, one minute	Between output and power supply terminals in common and earth
14. Vibration-proofing	Endurance 2a (total amplitude) = 3 mm 16.7 Hz, 3 directions, 2 hours each	Between output terminals and power supply terminals
15. Power consumption	6 VA	
16. Ambient temperature	-10 to +60° C	
	Humidity 10 to 95% RH (no condensation) (-20 to +60° C: In storage and transportation)	
17. Mounting	Flash mounting	
18. Outline dimensions (in millimeters)	120 W x .235 H x 190 D Case Black semi-luster coating	Refer to Outline drawing.
19. Weight	2.6 kg	

3. DESCRIPTION of FRONT PANEL

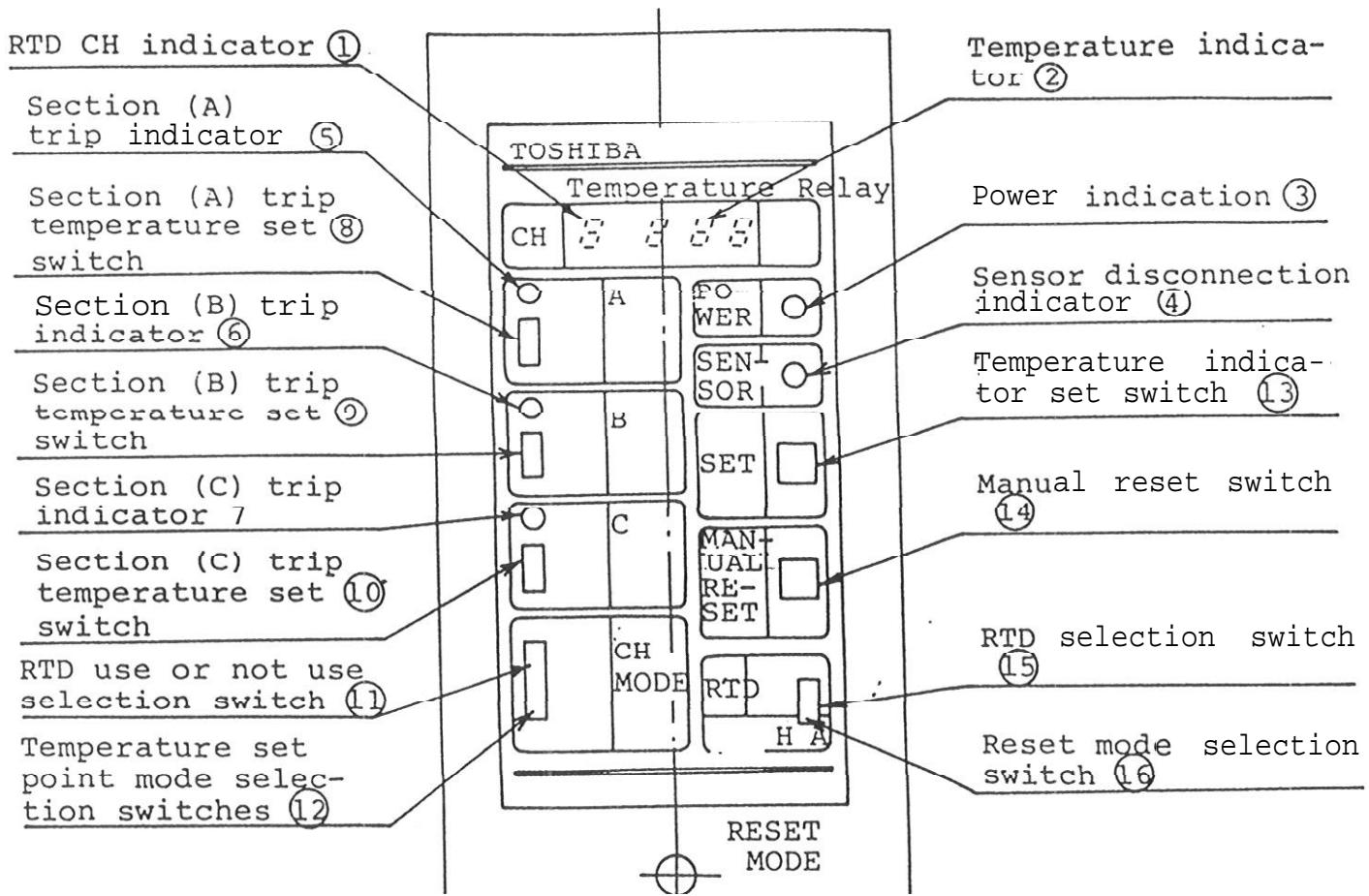


Figure.1 Front Panel Rayout

(1) RTD channel indicator

Indicates CR. No.'s 1 to 8 incrementally, on operation of temperature indicator set switch.

(2) Temperature indicator

Indicates the temperature of the channel selected by RTD channel indicator (1)

- Measuring range: -20°C to $+200^{\circ}\text{C}$ (1°C step)
- Display: Depends on how RTD is used, for example:

	Indicator	Meaning
Channel →		. RTD not used

When the following indicators flashes at 0.8 second intervals, some abnormality has happened:

	Indicator	Meaning
	 Temperature rises to or above trip set point.
		Temperature reading flashes at 0.8 second intervals.
		(Indicated temperature is between -20°C and 200°C)

			 RTD disconnection
			 200°C or higher
			 -20°C or lower

(3) Power indicator (yellow)

Turns on when power supply is kept on.

(4) Sensor indicator (Red)

Turns on when there is a break in an RTD wire.

(5), (6) and (7) Trip indicator (Red)

Turns on when indicating that the temperature monitored by the RTD's in either the A, B, or C channels has risen above the acceptable limit set on the relay.

(8) Section.(A) trip temperature set switch

4. WIRING

4.1 RTD Input Wiring

Attach cables as follows:

- Three shielded conductor cables for sensor inputs
- Twisted cable for alarm and trip contacts

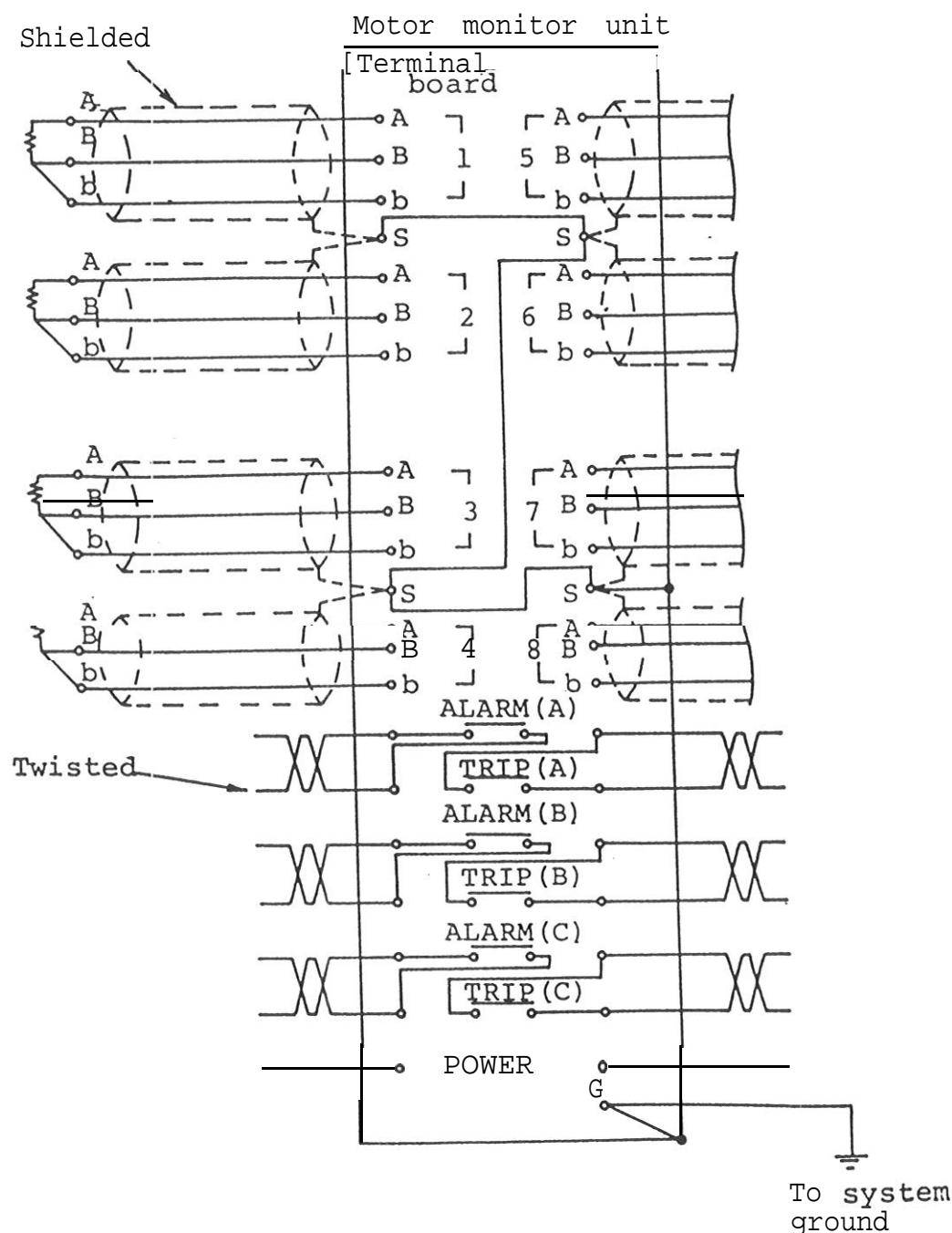


FIGURE 2 External Connection Diagram

4.2 Alarm Output Wiring

Connect the alarm signal leads (alarm, trip) to the terminals on the monitor unit's rear surface terminal board, according to the nameplate.

When an inductive load such as a relay is connected on the load side, apply spark suppression circuits on both ends of the inductive load to ensure the long life of the unit contact to suppress noise.

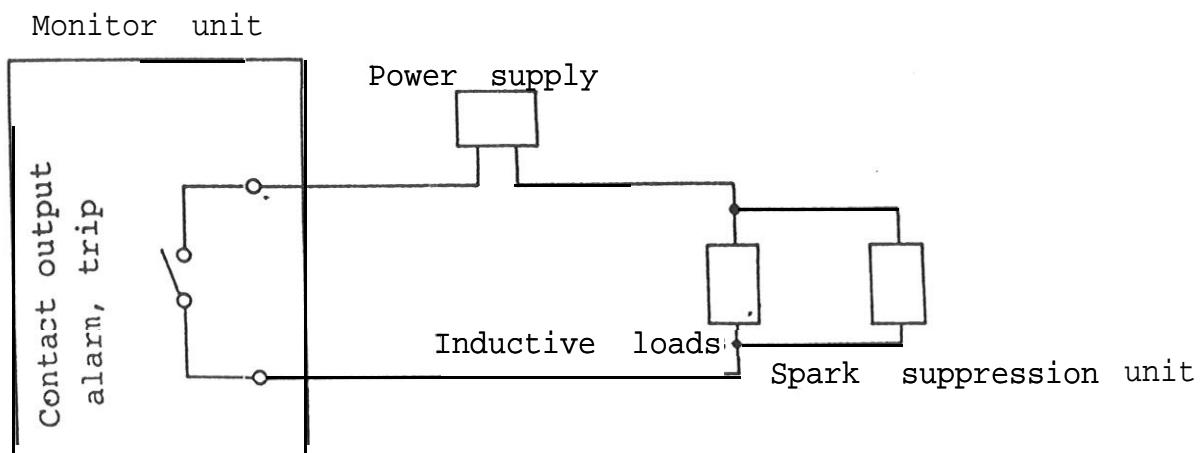


FIGURE 3 Output Circuit Configuration

4.3 Wiring for Power Supply

The monitor unit can use either 100 Vac to 120 Vac or 100 Vdc to 125 Vdc. Connect the leads to the POWER terminals on the rear surface of the unit.

5. OUTLINE DIMENSIONS

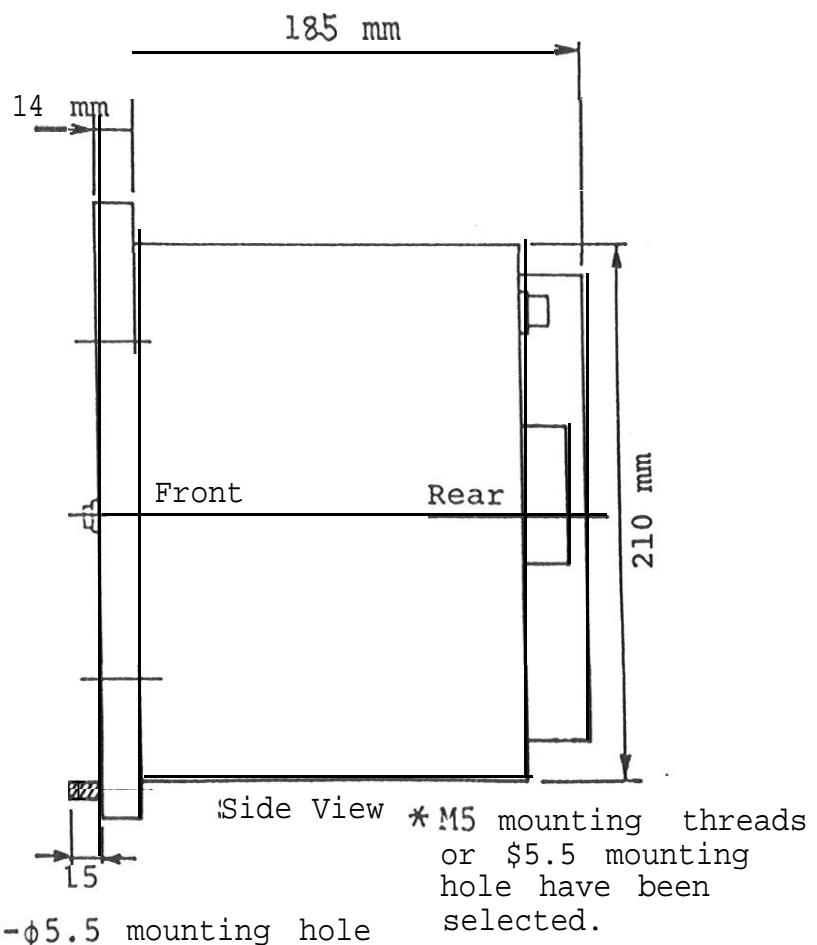
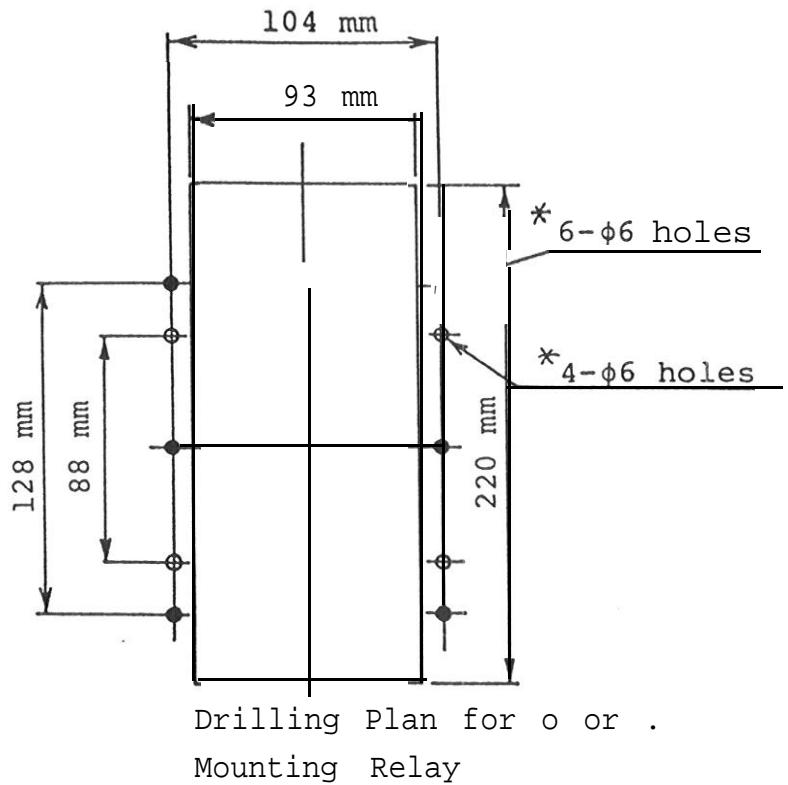
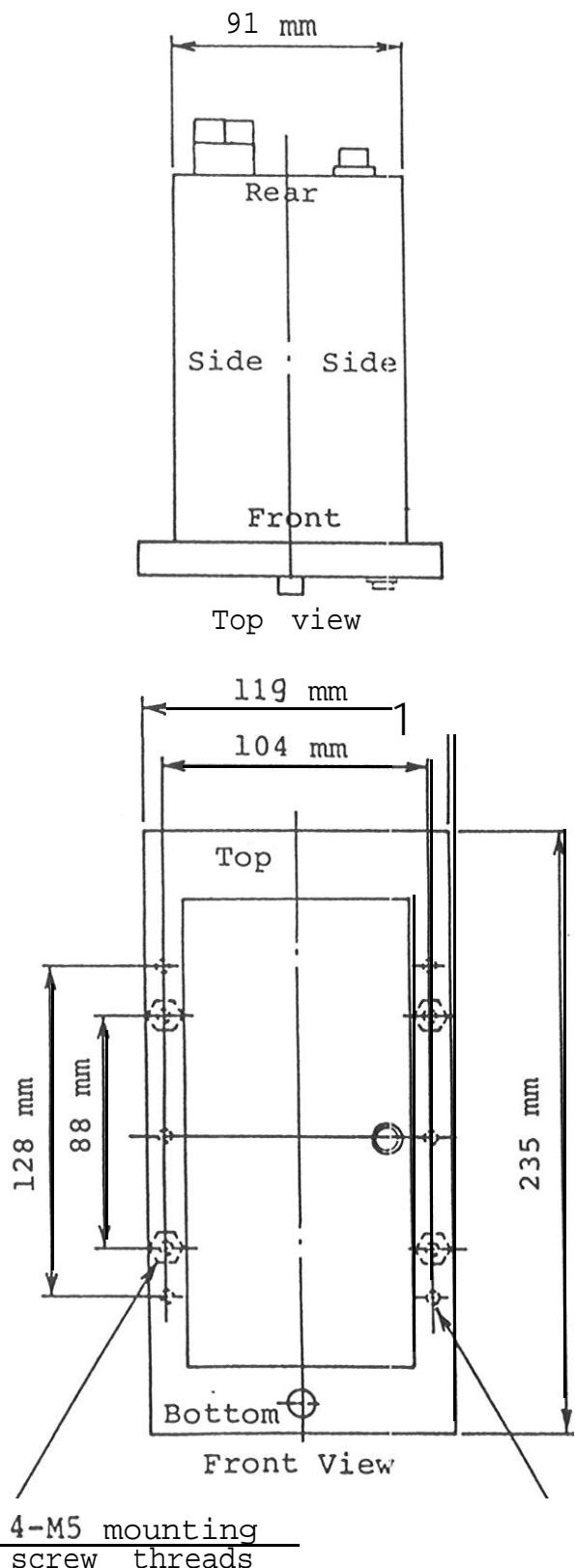
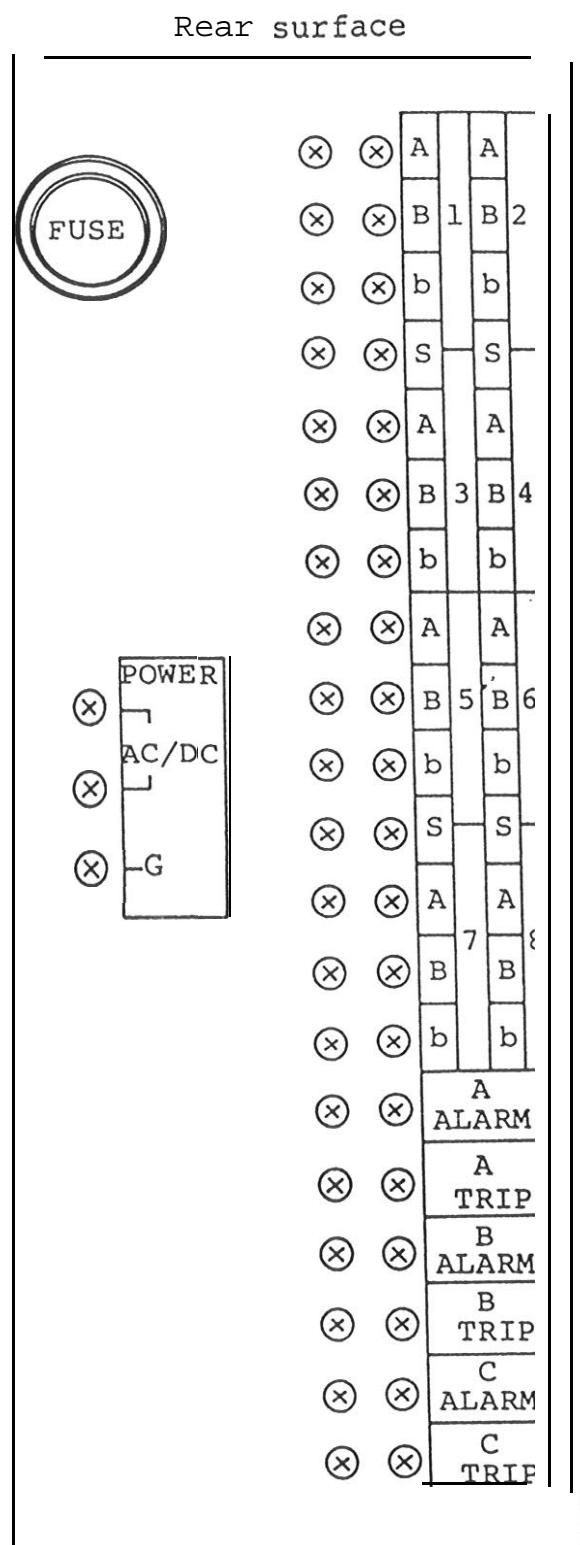


FIGURE 4 Outline Drawings

6. TERMINAL LAYOUT



* Applicable fuse
... AC250V, 2A

FIGURE 5 Terminal Layout